WHAT IS CLAIMED IS:

1. A control method of a permanent-magnet type synchronous motor provided with a frequency arithmetic unit of alternating current fed to the motor so that axial displacement is reduced based upon the axial displacement of the permanent-magnet type synchronous motor and a power converter that feeds alternating current of a variable frequency and variable voltage to the motor according to d-axis and q-axis output voltage directions based upon its frequency direction and a rotational phase direction, comprising:

a first step for operating axial displacement which is difference between the rotational phase direction and an actual rotational phase of the motor using a frequency or current information acquired from a control system as a first axial displacement signal;

a second step for estimating axial displacement caused in the motor by a control response angular frequency in the frequency arithmetic unit as a second axial displacement signal; and

a third step for inputting a third axial displacement signal acquired by adding the first and second axial displacement signals to the frequency arithmetic unit.

2. A control method of a permanent-magnet type synchronous motor provided with a frequency arithmetic unit that creates a frequency direction of alternating current fed to the motor based upon the axial displacement of the permanent-magnet type synchronous motor and a power converter that feeds alternating current of a variable frequency and variable voltage to the motor based upon the frequency direction, comprising:

a first step for operating axial displacement which is difference between a rotational phase direction and an actual rotational phase of

the motor using information acquired from a control system as a first axial displacement signal;

a second step for estimating axial displacement caused in the motor in relation to the frequency arithmetic unit as a second axial displacement signal; and

a third step for inputting a third axial displacement signal acquired by tinging the first and second axial displacement signals to the frequency arithmetic unit.

3. A control method of a permanent-magnet type synchronous motor according to Claim 2, wherein:

the second step includes a step for inputting information related to a frequency or current acquired from a control system and estimating the second axial displacement signal using a control constant of the frequency arithmetic unit.

4. A control method of a permanent-magnet type synchronous motor according to Claim 2, wherein:

the second step includes a step for differentiating a velocity frequency or a frequency direction acquired based upon a polar position sensed value of the motor, multiplying by a factor of proportionality, executing a first-order lag process and estimating the second axial displacement signal.

5. A control method of a permanent-magnet type synchronous motor according to Claim 2, wherein:

the second step includes a step for inputting a current value or its directed value of a q-axis (equivalent to a torque axis) of a rotatory coordinate system calculated based upon a sensed value of current flowing in the motor and the rotational phase direction and estimating the second axial displacement signal in consideration of a control constant in the frequency arithmetic unit.

6. A control method of a permanent-magnet type synchronous motor according to Claim 2, wherein:

the second step further includes a step for executing a first-order lag process.

7. A control method of a permanent-magnet type synchronous motor according to Claim 2, wherein:

the first step includes a step for operating a rotational phase signal of the motor based upon a polar position sensed signal of the motor and a step for operating the first axial displacement signal based upon deviation between the rotational phase direction and the rotational phase signal.

8. A control method of a permanent-magnet type synchronous motor according to Claim 2, wherein:

the first step includes a step for operating the first axial displacement signal based upon d-axis and q-axis output voltage directions, a sensed value of current flowing in the motor and the frequency direction.

9. A control method of a permanent-magnet type synchronous motor according to Claim 2, wherein:

the first step includes a step for operating current values of the d-axis and the q-axis based upon a sensed value of current flowing in the motor and the rotational phase direction and a step for operating the first axial displacement signal based upon the current values of the d-axis and the q-axis, the output voltage direction and the frequency direction.

10. A control method of a permanent-magnet type synchronous motor according to Claim 2, comprising:

a step for operating the rotational phase direction by differentiating the frequency direction.

11. A control device of a permanent-magnet type synchronous motor provided with the permanent-magnet type synchronous motor, a frequency arithmetic unit that creates a frequency direction of alternating current fed to the motor based upon axial displacement in the motor for a rotational phase direction and a power converter that feeds alternating current of a variable frequency and variable voltage to the motor according to output voltage direction of a d-axis and a q-axis based upon the frequency direction and the rotational phase direction, comprising:

first axial displacement signal operating means for operating axial displacement which is difference between the rotational phase direction and a phase of a rotor of the motor using information acquired from a control system to be a first axial displacement signal;

second axial displacement signal estimating means for estimating axial displacement caused in the motor in relation to the frequency arithmetic unit as a second axial displacement signal; and

means for inputting a third axial displacement signal acquired by tinging the first and second axial displacement signals to the frequency arithmetic unit.

12. A control device of a permanent-magnet type synchronous motor according to Claim 11, wherein:

the second axial displacement signal estimating means is provided with means for inputting a signal related to a frequency or current acquired from a control system and estimating the second axial displacement signal using a control constant in the frequency arithmetic unit.

13. A control device of a permanent-magnet type synchronous motor according to Claim 11, wherein:

the second axial displacement signal estimating means is provided with means for differentiating a velocity frequency or a frequency direction calculated based upon a polar position sensed value of the motor, multiplying by a factor of proportionality, executing a first-order lag process and estimating the second axial displacement signal.

14. A control device of a permanent-magnet type synchronous motor according to Claim 11, wherein:

the second axial displacement signal estimating means is provided with means for inputting a current value or its directed value of a q-axis (equivalent to a torque axis) of a rotatory coordinate system calculated based upon a sensed value of current flowing in the motor and the rotational phase direction and estimating the second axial displacement signal in consideration of a control constant in the frequency arithmetic unit.

15. A control device of a permanent-magnet type synchronous motor according to Claim 11, wherein:

the second axial displacement signal estimating means is further provided with first-order lag processing means.

16. A control device of a permanent-magnet type synchronous motor according to Claim 11, wherein:

the first axial displacement signal operating means is provided with means for operating a rotational phase signal of the motor based upon a polar position sensed signal of the motor and means for operating the first axial displacement signal based upon deviation between the rotational phase direction and the rotational phase signal.

17. A control device of a permanent-magnet type synchronous motor according to Claim 11, wherein:

the first axial displacement signal operating means is provided with means for operating the first axial displacement signal based upon the output voltage directions of the d-axis and the q-axis, a sensed value of current flowing in the motor and the frequency direction.

18. A control device of a permanent-magnet type synchronous motor according to Claim 11, wherein:

the first axial displacement signal operating means is provided with means for operating current values of the d-axis and the q-axis based upon a sensed value of current flowing in the motor and the rotational phase direction and means for operating the first axial displacement signal based upon the current values of the d-axis and the q-axis, the output voltage direction and the frequency direction.

19. A control device of a permanent-magnet type synchronous motor according to Claim 11, wherein:

the first axial displacement signal operating means is provided with a direct current sensor for sensing direct current flowing from a direct-current power supply to the power converter, current estimating means for estimating an each-phase current value of the motor based upon a direct current sensed value and means for operating current values of the d-axis and the q-axis based upon an each-phase current estimated value and the rotational phase direction.

20. A control device of a permanent-magnet type synchronous motor according to Claim 11, further comprising:

means for operating the rotational phase direction by differentiating the frequency direction.